WHAT IS CLAIMED IS:

1. A junction method for joining a workpiece made of a plurality of plate materials superimposed in their thickness directions at points, said method utilizing a junction tool which is configured by first and second tools placed on a junction axis substantially perpendicular to the superimposed surface of the workpiece while nipping the workpiece therebetween and which has a pin protruding from the distal end surface of the first tool along the junction axis and a depression depressed at the distal end surface of the second tool along the junction axis,

said method comprising:

a first step of nipping the workpiece with the junction tool in the direction of the junction axis and pressing the same while rotating one or both of the first and second tools about the junction axis so as to sink the distal end portion of the junction tool into the workpiece;

a second step of caulking, in the direction of the junction axis, the superimposed surface of the workpiece softened by a friction heat generated by the rotation of the junction tool by the pin of the first tool and the depression of the second tool;

a third step of generating plastic flow within the workpiece by the rotation of the junction tool so as to agitate the vicinity of the superimposed surface of the workpiece; and

a fourth step of pulling the junction tool from the workpiece.

2. The junction method of Claim 1, wherein a junction tool which has an annular concave groove formed at the distal end surface of the first tool so as to surround the pin is used.

3. The junction method of Claim 1, wherein a junction tool which has an annular convex portion formed at the distal end surface of the second tool so as to surround the

depression is used.

4. The junction method of Claim 1, wherein a junction tool in which the distal end surface of one of the first and second tools has a larger diameter than that of the other of the first and second tools is used, and

in the first to fourth steps, among the first and second tools, one that has a distal end surface with large diameter is rotated about the junction axis.

5. The junction method of Claim 1, wherein a junction tool in which one of the first and second tools has a large diameter portion which has a larger diameter than that of the distal end surface of the other tool and a small diameter portion which is placed at the distal end side of the tool with respect to the large diameter portion and is smaller in the diameter than the large diameter portion is used, and

in the first to fourth steps, among the first and second tools, one with the large and small diameter portions is rotated about the junction axis.

6. A junction method for joining a workpiece made of a plurality of plate materials superimposed in their thickness directions at points, said method utilizing a junction tool which is configured by first and second tools placed on a junction axis substantially perpendicular to the superimposed surface of the workpiece while nipping the workpiece therebetween and which has a pin protruding from the distal end surface of the first tool along the junction axis, an annular concave groove formed at the distal end surface so as to surround the pin, a depression depressed at the distal end surface of the second tool along the junction axis and an annular convex portion formed at the distal end surface so as to surround the depression,

said method comprising:

a first step of nipping the workpiece with the junction tool in the direction of the junction axis and pressing the same while rotating one or both of the first and second tools

about the junction axis so as to sink the distal end portion of the junction tool into the workpiece;

a second step of caulking, in the direction of the junction axis, the superimposed surface of the workpiece softened by a friction heat generated by the rotation of the junction tool by the pin and the concave groove of the first tool and the depression and the convex portion of the second tool;

a third step of generating plastic flow within the workpiece by the rotation of the junction tool so as to agitate the vicinity of the superimposed surface of the workpiece; and

a fourth step of pulling the junction tool from the workpiece.

7. The junction method of Claim 6, wherein a junction tool in which the distal end surface of one of the first and second tools has a larger diameter than that of the other of the first and second tools is used, and

in the first to fourth steps, among the first and second tools, one that has a distal end surface with large diameter is rotated about the junction axis.

8. The junction method of Claim 6, wherein a junction tool in which one of the first and second tools has a large diameter portion which has a larger diameter than that of the distal end surface of the other tool and a small diameter portion which is placed at the distal end side of the tool with respect to the large diameter portion and is smaller in the diameter than the large diameter portion is used, and

in the first to fourth steps, among the first and second tools, one with the large and small diameter portions is rotated about the junction axis.

9. A junction tool for joining a workpiece made of a plurality of plate materials superimposed in their thickness directions at points, comprising:

first and second tools that are placed on a junction axis substantially perpendicular to the superimposed surface of the workpiece so as to nip the workpiece, and one or both of

the first and second tools being disposed so as to be rotated about the junction axis,

wherein the first tool is provided with a pin protruding from its distal end surface along the junction axis, and

the second tool is provided with a depression which is depressed at its distal end surface along the junction axis.

10. The junction tool of Claim 9, wherein an annular concave groove is provided at the distal end surface of the first tool so as to surround the pin.

11. The junction tool of Claim 9, wherein an annular convex portion is provided at the distal end surface of the second tool so as to surround the depression.

12. The junction tool of Claim 9, wherein the distal end surface of one of the first and second tools has larger diameter than that of the other of the first and second tools.

13. The junction tool of Claim 9, wherein one of the first and second tools has a large diameter portion which has a larger diameter than that of the distal end surface of the other tool and a small diameter portion which is placed at the distal end side of the tool with respect to the large diameter portion and is smaller in the diameter than the large diameter portion.

14. A junction tool for joining a workpiece made of a plurality of plate materials superimposed in their thickness directions at points, comprising:

first and second tools that are placed on a junction axis substantially perpendicular to the superimposed surface of the workpiece so as to nip the workpiece, and one or both of the first and second tools being disposed so as to be rotated about the junction axis,

wherein the first tool is provided with a pin protruding from its distal end surface along the junction axis and an annular concave groove at the distal end surface so as to surround the pin, and

the second tool is provided with a depression which is depressed at its distal end

surface along the junction axis and an annular convex portion at the distal end surface so as to surround the depression.

15. The junction tool of Claim 14, wherein the distal end surface of one of the first and second tools has a larger diameter than that of the other of the first and second tools.

16. The junction tool of Claim 14, wherein one of the first and second tools has a large diameter portion which has a larger diameter than that of the distal end surface of the other tool and a small diameter portion which is placed at the distal end side of the tool with respect to the large diameter portion and is smaller in diameter than the large diameter portion.